least one piston.

Claims

- [c1] A well logging tool, comprising:
 a housing;
 at least one piston moveably disposed on the housing;
 at least one sensor disposed on the at least one piston;
 a pressure compensation system operatively coupled to
 the at least one piston such that a pressure at a back
 side of the at least one piston is substantially identical to
 a pressure outside the well logging tool; and
 a piston deployment mechanism for deploying the at
- [c2] The well logging tool of claim 1, wherein the piston deployment mechanism comprises a piston spring disposed at the back side of the at least one piston.
- [c3] The well logging tool of claim 1, wherein the pressure compensation system comprises a pressure-compensating chamber having an opening to an exterior of the housing, a fluid-filled reservoir, and a compensating piston moveably disposed between the pressure-compensating chamber and the fluid-filled reservoir such that a pressure inside the pressure-compensating chamber and a pressure inside the fluid-filled reservoir

- are substantially identical.
- [c4] The well logging tool of claim 3, further comprising a compensating spring connected to the compensating piston for exerting a force on the compensating piston.
- [c5] The well logging tool of claim 4, wherein the piston deployment mechanism comprises a piston spring disposed at the back side of the at least one piston.
- [c6] The well logging tool of claim 1, further comprising at least one piston liner moveably disposed between the housing and the at least one piston for extending a reach of the at least one piston.
- [c7] The well logging tool of claim 4, further comprising a controller connected to the compensating spring for regulating the force exerted by the compensating spring.
- [08] The well logging tool of claim 7, wherein the controller is operated by a motor.
- [09] The well logging tool of claim 7, wherein the controller is operated by hydraulic pressure of drilling fluids.
- [c10] A well logging tool, comprising:

 a housing;

 at least one piston moveably disposed on the housing;

 at least one sensor disposed on the at least one piston;

means for keeping a pressure at a back side of the at least one piston substantially identical to a pressure outside the well logging tool; and means for deploying the at least one piston.

- [c11] A method for well logging using a well logging tool having at least one piston disposed on a tool housing and a pressure compensating system that maintains a pressure at a back side of the at least one piston to be substantially identical to a pressure outside the well logging tool, wherein the at least one piston includes at least one sensor, the method comprising:

 disposing the well logging tool in a borehole;
 deploying the at least one piston to establish contact between the at least one piston and a wall of the borehole; and measuring a formation property using the at least one
- [c12] The method of claim 11, wherein the deploying comprises exerting a force on the back side of the at least one piston by a spring.

sensor.

- [c13] The method of claim 11, wherein the deploying comprises using a hydraulic pressure of a drilling fluid.
- [c14] The method of claim 11, the measuring was performed

while drilling.

[c15] The method of claim 11, wherein the at least one sensor is selected from a temperature sensor, a pressure sensor, a resistivity sensor, an inductive imager, a density sensor, a neutron sensor, a sonic sensor, a nuclear magnetic resonance sensor, a dipmeter, and a seismic sensor.